DATA PROCESSING DIGEST

A SERVICE OF CANNING SISSON AND ASSOCIATES

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Applications

"Application of an electronic data processing machine to inventory control"

Robert P. Beals, Chrysler Corp.

Paper presented at Annual Meeting of Association for Computing Machinery, September 1955.

Procedures analysis and systems design were vital to computer studies

This paper gives a step-by-step report of the selection of electronic equipment for Chrysler's MoPar Division inventory control program.

An informal committee was established in 1952 consisting primarily of people from the finance area. Visits were made to a number of computer manufacturers to acquaint the group with equipment. At the same time, the group made studies of various operations in the organization to see which area would receive the greatest economic benefits from using electronic equipment, and which also would yield more complete and timely information for the benefit of the Corporation.

Potential benefits were:

1. "Improved controls through the availability of more accurate and current data upon which to base decisions..."

2. "Optimum distribution of items to Parts Plants through short reporting time cycles..."

3. "Substantial economies in the field of clerical operations and, even more importantly, reduced inventory costs by decreasing the number of items and quantities in stock to a minimum..."

Inventory control appeared to provide "an opportunity for determining the real value of having available more complete, accurate, and timely information. In addition, it was considered that the application could be justified solely on the basis of reduction in clerical operating costs."

First, all of the office departments at the Parts Division Central office cooperated in preparing a procedure manual, which, when completed, "turned out to be our most effective means of educating all employees assigned to the project." This manual also provided the manufacturers with information

to help them prepare proposals. Next, the group worked with the manufacturers, to find the best combination of equipment for the job. Members of the group attended the Programming schools of the two manufacturers chosen. The groups' goals were:

"1. Reduction of time lag in all reporting cycles.

"2. Elimination of all possible manual handling.

"3. Elimination of all possible calculation and review functions.

"4. Generation of reports sufficiently comprehensive to allow completion of an entire job without reference to other reports.

"5. Improvement of customer service through elimination of stock out conditions by improved detail and summary reporting.

"6. On a more long-range basis, provision of data which at some future time could be manipulated to provide even more complete analysis of our inventory and distribution requirements."

The group of areas which were recommended for mechanization in the final report were: Invoicing, inventory control, sales reporting, cost of sales reporting, and accounts receivable. To eliminate the necessity of completely programming and testing the system for two types of equipment, the decision was made on the IBM 702, based on the following points:

1. Because of the expense and the possibility of obsolescence, the equipment would be leased, rather than purchased.

2. The equipment was available immediately.

3. The manufacturer could provide technicians to help get ready for the installation.

A complete procedures analysis and detailed build-up of new systems was now undertaken. "...this systems clean-up should hardly be considered as a necessary evil--it is probably one of the more important by-products of this type of project and many of the economies to be gained from the application of high-speed data processing equipment can in many cases be attributed to this systems clean up rather than to the equipment itself."

By January 1955, the inventory control area was "described to such a point that we could begin a full scale programming effort within this one functional area." About 13 man months were spent in writing 13,000 instructions for the 702 for the inventory control function. About 6000 of these instructions are for converting punch card information to magnetic tape form, and will not need to be used for the other functional areas. Debugging of this program is being done by operating it in parallel with the present punch card system and comparing the results.

The MoPar Division supplies parts to more than 12,000 dealers and MoPar distributors throughout the world. The sales activity varies between 30,000 and 40,000 line items of sales per day. The punched cards which have been used for the preparation of shipping orders will be converted to magnetic tape for the preparation of invoices by the 702. The output tape from the invoicing will serve as input for the inventory control run. Other output tapes will be used in future applications in sales analysis, cost of sales, and accounts receivable. Other transactions affecting the inventory to be converted from punched cards to magnetic tape: purchase requisitions, purchase orders and releases, receiving reports, stock transfers between plants, material requisitions, inventory and commitment adjustments, returned material, scrapped material.

The daily inventory control operation is as follows: "The master record for a part is read into memory. Then a transaction record is read. The part numbers are compared. If the transaction part number is low we have activity on a part for which we have no master record. This of course should not happen, but if it does we will print it out on the typewriter and take necessary corrective action. If the transaction part number is high we have no activity for the master record in memory so we read the next master record. When the part numbers are equal we update the proper field in the master record according to the transaction code. The 702 posts these quantities as well as the sum of the original fields to a 'control total' field. This control total is used to check the accuracy of the posting operation... [then] the 'availability' is compared with predetermined re-order levels for each plant and for the national total. The availability is the sum of 'on requisition,' 'on order,' 'in transit,' 'on hand' fields less the quantity on back order. On the basis of this review the 702 will determine whether procurement, distribution, or follow-up action is necessary. If action is not necessary the master record will be written out on an output tape which will be used as input for the next run.

"If action is necessary the 702 will print a Stock Status Report which will clearly indicate the area which needs attention. The Central Procurement Department will take the necessary action to bring the inventory within the proper limits of control. The action may be to place additional orders, institute follow-up action, to transfer stock from the base area to Parts Plants, or to reduce commitments, inventories or stocking points."

"Data processing systems: how they are used"

Eugene M. Grabbe, Ramo-Wooldridge Corp.
CONTROL ENGINEERING, December 1955; pages 40-45.

This is the introductory article in the series of 14 which will cover the selection and application of data processing equipment and systems. A brief explanation is given of the uses for computing equipment in scientific applications, business data processing, and process control systems.

"Automatic data processing--concept and application"

Panel discussion, NMAA 4th Annual Convention, printed in JOURNAL OF MACHINE ACCOUNTING

*Part II--Installation of Univac by Air Materiel Command, October 1955; pages 3, 7, 9, 10-15, 17, 20, 21, **

B. C. Connelly, HQ Air Materiel Command, Wright-Patterson Air Force Base

AMC analyzed needs, trained staff, educated employees, before installing computer

The Air Force began its investigation of electronic computing equipment in 1952. A sample problem was selected and submitted to two computer manufacturers. Meanwhile personnel selection and installation site selection were undertaken. A combination of non-professional persons experienced in punch-card programming and professionally trained computer persons made up the staff. They were sent to the Remington Rand training school (by this time the Univac had been selected). A careful education of management was begun, first with an hour of orientation, then with an elaborate "dedication ceremony," which also "sold" the installation to the rest of the employees. A business show type of display accompanied the "dedication," which consisted of exhibits and a demonstration of the equipment.

The installation cost was approximately $100,000, and recommended time for site preparation and installation is three to four months. During the preparation time, the programmers prepared and checked out the programs for the first problems to be put on the machine. The author warns that extra hours checking program and data accuracy save time and trouble later when the problem is in the computing system. Also, a system of "carry-over" from shift to shift is important, to keep the work flowing smoothly. The Air Force Univac is in operation on a three-shift, 7-days-a-week basis.

Debugging of programs takes about 35% to 40% of available time. Fifteen percent is reserved for preventive maintenance, and they have averaged 5% for emergency maintenance.

The problems being run or planned for are maintaining stock level on 800,000 items, a 40,000 page report on projected gross requirements, civilian payroll, aptitude test correlation, inventory control, and a number of aircraft evaluation reports.

Suggestions for those about to begin an investigation into the use of electronic equipment are given by the author:

Allow adequate lead time.

Carefully select your staff.

Carefully select your subject matter areas for application.

Insist upon proper "staff education."

Don't forget the less glamorous requirements of ancillary equipment.

Have adequate controls for operating procedures.

Invest in a modest research program in new procedures and techniques.

And "last, but not least, remove from the minds of management that the introduction of electronic data processing devices is a cure-all for business ills."

*See *DPD this issue, page* 11, *for Parts I and III.*

"Up-to-the-minute car reporting"

RAILWAY AGE, November 28, 1955; pages 32-34.

Automatic compiling of train consists from waybills

The Erie Railroad is using IBM punched card machines, and card-to-tape perforators and Teletype equipment to prepare conductors' wheel reports.

The Erie Railroad converts waybill information to punched cards, one card per car. From these, first the conductors' wheel reports are made, and then a train consist in the form of a teletype tape which transmits the information to the stations needing it. By-product tapes at receiving points are used to prepare punched cards for other purposes.

"Kennametal's internal order processing system"

THE OFFICE, November 1955; pages 73-76.

Order, production control, and stock room shipping departments are linked by teletype to speed processing and reduce duplication of forms typing.

(See DPD, October 1955, page 15.)

Equipment

"Elliott Brothers (London) Limited"

***DIGITAL COMPUTER NEWSLETTER** (Journal of Association for Computing Machinery, October 1955; pages 292-294.)*

English computer is flexible

The Elliott 405 Unit-construction Business Computing System "consists of a basic unit (Systems Centre) to which one or more other units (Input, Output, or Storage) can be connected, the individual units being chosen to meet the need of the individual user. Further units can be added as requirements dictate."

Inputs include teleprinter tape units and punched card reader. Storage units are magentic drum, magnetic disc, each of which contain additional quick access nickel delay line storage of 128 words. Total drum capacity, 4096 words. Total disc capacity, 16,384 words.

Ancillary memory units include the Elliott multi-channel magnetic film unit (using 35 mm film coated with magnetic oxide), each reel of film containing 300,000 words; and magnetic tape units, each reel of tape containing 50,000 words. Output units include tape perforators, electric typewriter, printer, magnetic tape.

(See also DPD December 1955, page 10, "The Scope for Electronic Computers in the Office.")

"Automation in the office"

***OFFICE MANAGEMENT**, November 1955; pages 37, 84.*

New equipment furthers electronic banking methods

The new electronic bookkeeping machine by National Cash Register Co., the "Postronic," was designed primarily for checking account bookkeeping. It electronically verifies the proper depositor account selection, picks up and verifies the depositor's old account balance and determines if the account balance is a positive balance or an overdraft.

Burroughs "Sensitronic" performs several posting operations without assistance from the operator. A magnetic code stripe on the back of the posting form is used to give instructions to the machine. When entries are made by the operator, these items also are printed on the sheet. The machine automatically computes and prints the new balance and also records it magnetically on the strip for future posting. A similar machine, the "Bank-o-Matic," uses input information from a punched tape to complete an account transaction and prepare a trial balance. It can also prepare monthly statements.

More on ERMA (Bank of America)

"Automation in the office"
OFFICE MANAGEMENT, November 1955; pages 36, 37.

"Paperwork and red tape cut by new computers"
AUTOMATIC CONTROL, November 1955; pages 29-31.

In the second article above, a diagram is included, showing the processing of a single check through ERMA from the teller's window to the customer's monthly statement. Other bank equipments mentioned briefly are: IBM, Burroughs, International Telemeter, Sperry Rand, NCR, I. T. and T., and "Diana" (Chase Manhattan Bank).

"Push-button banks"

WALL STREET JOURNAL, December 7, 1955; page 1, 10.

Banks and computer manufacturers are actively devising specialized electronic equipment for banking problems.

"The Automation Handbook"

Published by Richard Rimbach Associates

This publication is "a pictorial-descriptive Handbook covering all the products exhibited at the Second International Automation Exposition, held on the Chicago Navy Pier, November 14-17, 1955."

"Information Processing Equipment"

M. P. Doss, editor, and contributors
New book--published by Reinhold Publishing Corp.

Material presented at a symposium of the American Chemical Society has been edited and compiled into a handbook on a wide variety of "information-processing" equipment. Ten chapters cover each of ten types of equipment, including typing and duplicating machines, lens-less copying, photography (both wet and dry), microcopying, printing, projectors, recording devices, punched cards, and electronic computers.

Each chapter is generously illustrated with photographs of the equipment and includes a bibliography of articles and books on the chapter subject. The book contains 262 pages of text and about 156 illustrations. The book necessarily cuts off at a pre-publishing date, and cannot present the most recent developments. This is most evident in Chapter 10, which attempts to cover the fast-moving field of electronics. Price of the book is $8.75.

"News notes of the industry"

JOURNAL OF MACHINE ACCOUNTING, November 1955, page 18.

Garment tag sorter and magnetic tapes

Underwood Samas Salestag Converter--an automatic high speed salestag converter operates at a speed of 7500 tags per hour, converting Dennison and Kimball merchandise tags into 40-column cards. The cards may then be processed through the Samas Sorter, Tabulator and Summary Punch for a variety of computations and reports. The Converter may also be used as a standard punched card Reproducer.

ORRadio Industries--manufactures fifty different types of magnetic tapes for electronic computers, to be known as IRISH Instrumentation Tape No. 311.

Programming

"Remington Rand (Automatic Programming)"

DIGITAL COMPUTER NEWSLETTER (Journal of Association for Computing Machinery, October 1955; page 291.)

Tedious programming can be eliminated

"The automatic program, in effect, is a dictionary permitting the machine to translate succinctly expressed programmers' wishes into routines of instructions--automatically, swiftly, and with complete accuracy. It is not a piece of equipment, but a new and powerful programming technique."

"...'compiling routine'...translates the master program into computer code and records the finished program for further purposes."

"The development of automatic programming--'electronic dictionaries'--makes the computer do the actual work of instructing itself, eliminating the tedious and time-consuming programming work of analysis, processing, coding, writing and checking programs of instructions for electronic computers."

"EDP Programming Notes"

JOURNAL OF MACHINE ACCOUNTING, November 1955; page 20.

A new JOURNAL feature, this section will be devoted to articles on programming for electronic computer systems. The first article discusses the Remington Rand automatic programming techniques.

General Information

"Thinking ahead"

James R. Bright
HARVARD BUSINESS REVIEW, November-December 1955;
pages 27, 28, 32, 156, 158, 159, 163, 166.

Automation cliches are cleared away

The need is stressed for realistic thinking on questions raised by "the nature of automation and its effects on manufacturing and production." Some of the points made by the author are the following:

"...in 12 out of 13 of the particular plants I have studied, the number of people employed today is higher than it was prior to automation."

"Many changes in materials, processes, and product design...produce as much displacement as automation, or more."

"I feel reasonable certain that the general effect of automation is to lessen the skill qualifications and the training requirements of the remaining production line workers, rather than add to them."

"Automation has one notable impact on the character of the maintenance force: the new skills demanded of plant electricians....it seems we need a new class of plant electricians--'electronic technicians.'"

"...maintenance costs in some kinds of plants will actually drop under automation."

"...the total [automated] plant *may* be less expensive than a conventional plant."

"To the extent that the small businessman has to pay for experiments with new, advanced types of machines in order to survive in competition with the larger companies, he will run into real difficulty in the age of automation."

"*In general*... automation reduces flexibility. The large, highly automatic manufacturer is therefore likely to lose a certain flexibility which the smaller firm will retain.... Thus automation may very well prove an actual blessing to the small businessman who is fast on his production and sales feet."

"There is a frightful lack of perspective on our industrial history as a whole....We need factual studies of a broad and historical nature that will fix our position now, our status at past points, and thus enable us to get some feeling for the rate of change, as well as the kinds of change, that technology is thrusting on us."

"Will new methods of data processing affect organization planning?"

Herbert O. Brayer
AMERICAN BUSINESS, November 1955; pages 9-11, 40, 41.

Centralization? Decentralization? The system will decide

The title question is restated in the article as, Will EDP lead to a centralized or decentralized type of organization? A survey of top people concerned with this question revealed two attitudes toward EDP among management. "Top management wants the most efficient and economical operations it is possible to get without upsetting present administrative and staff personnel, and is even willing to accept temporary dislocation during a period of change. Divisional and department executives, on the other hand, are showing a greater wariness and even reluctance to accept IDP and EDP changes that involve the crossing of traditional lines of administration or the altering of present centralized or decentralized systems."

Whether IDP or EDP is designated has a bearing on the centralization-decentralization attitudes. "The expense of new equipment is not necessarily a factor in whether a business can or cannot use the principle of IDP, either partially or wholly!" However, "as one executive recently commented, 'The minute you substitute "electronic" for "integrated" in the phrase "integrated data processing" you are back where you started. The expense of electronic equipment forces centralization.'"

"...not 1 executive in 10 [in the survey] either believed or foresaw a reversal of the trend toward *decentralized management* because of IDP or EDP! But there is a difference of opinion when it comes to a trend toward centralized accounting and clerical operations."

These differences of opinion are presented in the words of seven well known procedures and methods men. The author's conclusion is "well summed up by Ned Chapin in his new book, *An Introduction to Automatic Computers:* ... 'It is not the automatic computer itself, but it is the type of business *systems* that are devised for use with an automatic computer that determine whether centralization or decentralization of management is furthered by the use of an automatic computer.'"

"Why automation will increase the importance of personnel"

Ralph W. Fairbanks, Fairbanks Associates, Greenwich, Conn.
OFFICE MANAGEMENT, November 1955; pages 24-26, 86.

People will get the complex tasks, computers the easy ones

The office will always be dependent upon people because of the exceptions which keep office operations from being completely routine and subject to automation. "...usually the office will be forced, as it progresses toward an ever-higher degree of automation, to do what it should do under a good system plan, anyway. It will be forced to divide its work flow into simple and complex routines....Human workers will continue to handle the complex tasks, the exceptions and variation in the normal work flow."

"...as machines assume more and more of the work of the lower level clerks in our offices, it will mean an increasing burden of work on the clerical workers. Every situation calling for any degree of judgment or human ability will be thrown on this cadre. Thus the trend toward automation makes more imperative, not less so, the need for a sound and intelligent personnel program based on good human relations."

Four tools of a good human relations program are described, along with the benefits they can obtain for the office.

"Automatic data processing--concept and application"

Panel discussion, NMAA 4th Annual Convention, printed in JOURNAL OF MACHINE ACCOUNTING

Part I--Definition and explanation of data processing, September 1955, pages 3, 5, 6, 16, 18-21. R. M. Gilmore, Jr., Chrysler Corp. Contains some generalized statements on studying the use of electronic equipment in a business.

Part III--Preparatory work necessary prior to installation, November 1955; pages 3, 5, 6, 14-16. Includes the training of company personnel, systems study, design of computer system, and conversion from present methods. This material has been covered in DPD, April, 1955, and August 1955.

Part II of the above panel is abstracted in DPD this issue, page 4.

"Justifying the use of an automatic computer"

Ned Chapin, Illinois Institute of Technology
JOURNAL OF MACHINE ACCOUNTING, September 1955; pages 9, 10, 14.

Computer justification begins with systems design

A method is given by which companies of any size can evaluate the benefits to be derived from the use of an electronic computer.

Benefits are of two kinds: dollar benefits and "irreducible" benefits. Dollar benefits can be derived by figuring the "savings" and comparing them with amortization figures. If the saving is equal to or less than the amortization charge, then the justification must be made on the basis of the irreducible benefits such as better competitive position and better management information.

Actually, "the saving exists only because of the systems analysis work that was done, and this correctly suggests that the amount of saving is dependent upon the quality of the systems analysis work."

"Office Automation" Up-dating Service Newsletter No. 1 *

R. Hunt Brown, Automation Consultants

Newsletter No. 1 contains five pages on Economies of Integrated Data Processing; nine pages of an index of the book. A brief report on the estimated savings of an IDP system at an Air Force Base is presented, showing that one Flexowriter would save about $4000 per year in the preparation of teletype messages.

*See *DPD November 1955, page 7 for review of the book itself.*

"What is integrated data processing?"

D. G. Hoffman, UARCO, Inc.
JOURNAL OF MACHINE ACCOUNTING, November 1955; pages 7, 9, 17.

Cards, paper or magnetic tape can serve as "common language" medium

Integrated data processing is defined as a method that enables data to be self-perpetuating...or the automatic transfer of repetitive data. "When an IDP system is used, the unreliable human element of transcribing a common language from one medium to another, as well as translating one native language into another, is completely eliminated at all key operating points."

Although 5-channel paper tape has been identified as "the common language," the author states that "it is important to realize that the term 'common language' no longer refers to one specific medium. Punched tape, punched cards, and magnetic tape all have their particular advantages and disadvantages, both operational and functional. Your choice of a common language depends on your own specific problems and requirements.

"It is equally important to realize that an IDP system using one common language can be interconnected with another system using a different common language. And further, that machines whose native language differs from the common language being used can, nevertheless, be fitted into the IDP system by means of equipment which converts the native to the common language.

"The significant characteristic of integrated data processing is not the use of any given common language. The basic principle is the automatic perpetuation of repetitive data."

EDP (electronic data processing) may be combined with IDP in larger organizations. "In such cases IDP provides the automatic input and the EDP equipment becomes a part of the over-all 'Integrated Data Processing' system."

"Common language and case histories"

Lois Stohr Richards, UARCO, Inc.
JOURNAL FOR MACHINE ACCOUNTING, December 1955; pages 4-7, 30, 31.

Five-channel and eight-channel paper tape are compared, by showing how each represents alphabetic and numeric information in binary-coded decimal representations. Several examples of the application of integrated data processing principles are given.

"Automation is an asset in banking"

Ray R. Eppert, Burroughs Corp.
AUTOMATION, November 1955; pages 57-61.

Several Burroughs machines are described, along with some general statements, drawn from American Banking Association's findings, about electronics in bank applications. (See DPD, April 1955; Vol. I, No. 1; page 2, "Automation of Bank Operating Procedure.")

"Financial aspects of automatic computer acquisition"

Ned Chapin
THE CONTROLLER, November 1955; pages 523-525.

An investment in a computer must earn its keep

A re-thinking of the financial significance of the dollar figures contained in automatic computer feasibility studies is urged by the author.

The financial gains from using an automatic computer depend upon the method of financing its acquisition. "...funds invested in an automatic computer must at least earn their keep in terms of a rate of return on the amount of the investment." Use of a formula more "financially sound" than the common "payoff" formula is recommended in calculating the financial aspects of computer acquisition.

(See also: DPD December 1955, "An Introduction to Automatic Computers: A Systems Approach for Business," page 8; and "Justifying the use of an automatic computer," page 11, this issue.)

"Centralized data processing may be mistake, SAM speaker warns"

OFFICE MANAGEMENT, November 1955; pages 38, 78, 81, 82, 84.

Computer should be close to the problems it must solve

"Over-centralization of data processing machine facilities may be a mistake from the operations research view point." This suggestion was made by Harold F. Smiddy of General Electric at an Operations Research Conference sponsored by the Society for Advancement of Management, September 29-30, in New York. "'Is not the real need to keep the machines...decentralized so that, properly coupled and integrated, the models they work on shall themselves be those of the actual operations involved...?'"

"Digital computers need orderly number systems"

Irwin L. Lerner, Royal McBee Corp.
CONTROL ENGINEERING, November 1955; pages 82-89.

Non-technical explanations of binary, decimal number systems

This is the second article in a series, and gives an easily understood explanation of computer number systems, contrasting decimal, octal and binary systems, and showing the use of binary codes to represent decimal numbers. The article is non-technical in its approach, and will help those unfamiliar with computer design to understand the internal number representation of electronic computers.

(See DPD November 1955, page 4, for first article of this series, "Data processing systems: how they function.")

"Digital automation"

Martin L. Klein, Frank K. Williams, Harry C. Morgan
INSTRUMENTS & AUTOMATION, November 1955; pages 1930-1936.

Here is another excellent explanation of number representation in electronic computer systems, beginning with the elements of any number system, these rules for progression from one number to the next, and the application of these rules to the decimal system, an arbitrary letter system (for purposes of demonstration), and then to binary. Arithmetic operations using binary, conversion to decimal and octal, and binary-coded decimal systems are covered.

Management Decision-making Techniques

"Inventory control problems"

RESEARCH FOR INDUSTRY, Stanford Research Institute News Bulletin, November 1955.

Equations found to aid inventory control

Stanford Research Institute cooperated in a study of Southern Pacific Company's inventory control system, which resulted in the formation of "a total cost equation and an optimal limit equation, which define for any given combination of lead time, unit cost, and estimated demand the particular upper and lower ((stock control)) limits reducing total supply costs to a minimum." Evaluation of the findings was made by a test run of the problem--reworking 20 months of each item's supply and demand activity using the new rules--on an IBM 701.

"Operations Research Digest"

New publication--published by Operations Research Institute, Inc., Princeton, N. J.

Material is rewritten and condensed from other sources, and presented in non-technical language. "Operations research" ideas are explained through simple examples and case histories. Published quarterly.

"Automatic machining--a view and a preview"

Waldo H. Kliever, Clevite-Brush Development Co.
CONTROL ENGINEERING, October 1955; pages 84-89. November 1955; pages 77-81.

These are the second and final articles in the series which began in the September issue. These two parts consider ways to measure workpiece size by analog and digital methods. (See DPD October 1955, page 15 for first article of the series.)

Training, Seminars, Meetings

Engineering and Management Course, University of California at Los Angeles, Jan. 23 through Feb. 2, 1956. Includes five classes in data processing and related subjects among others. For further information write: Edward P. Coleman, Coordinator, Engineering and Management Course, College of Engineering, University of California, Los Angeles 24, Calif.

Western Computer Conference (IRE-AIEE-ACM), Feb. 8-10, 1956; San Francisco. For further information write Dr. Oliver Whitby, Stanford Research Institute, Stanford, California.

Third Annual High-Speed Computer Conference, February 14-17; New Orleans. For further information write: Dr. Leon Megginson, College of Commerce, Louisiana State University, Baton Rouge, Louisiana.

Electronic Conference and Exhibit, American Management Association; February 27-29, Hotel Commodore, New York. For further information, write AMA, 1515 Broadway, Times Square, New York 36, New York.

ORSA-TIMS Meeting (tentative), March 30, 31; University of California at Los Angeles.

Southern California Business Show (N.A.C.A.) April 24-27; Ambassador Hotel, Los Angeles. For further information write: R. E. McRann, General Chairman, So. Calif. Business Show, 731 South Spring St., Los Angeles 14, California.

N.M.A.A. Second Annual Electronics Business Systems Conference, Nov. 8, 9, 1956; San Francisco. Sponsored by the eleven Western N.M.A.A. Chapters.

Third International Automation Exposition, November 26-30, 1956; New York Trade Show Building.

Comment

Programming and maintenance requirements spawn new training courses

The need for trained personnel in the programming and maintenance aspects of electronic systems has brought forth at least two courses especially set up for these needs.

"Programming for Business Computers," is a home study course designed to help persons prepare for the programming jobs which are coming up in increasing numbers. Business Electronics, Inc. is composed of business men trained and experienced in business data processing. They have designed their course around actual problems in designing electronic systems for Payroll, Inventory Control, Accounts Receivable, etc.

Forty-eight assignments may be completed at the student's own speed, and are sent in for grading and evaluation by the Programming Staff. A diploma is issued upon satisfactory completion.

Requests for information about the course should be addressed to J. H. Herrett, Director of Education, Business Electronics, Inc., P. O. Box 3330, Rincon Annex, San Francisco 19, California.

Since "automation" may begin displacing unskilled and semi-skilled people in the near future, the Los Angeles Adult Education system has initiated a course for training such persons as electronic technicians. The course totals 720 hours of instruction (theory and lab), over eight terms. Classes are limited to 15 students each, to provide adequate question periods and laboratory participation.

Based on a survey, the "typical" student taking this course is 36 years old, married, has two children, is in factory production in a manufacturing plant employing 500-3000 people in an unskilled or semi-skilled capacity, and has had two years of high school education.

The course is based on the premise that the advent of automation will demand more electronic technicians. It has been organized to provide new jobs for persons displaced by automation, as well as to allow people to up-grade their skills in an expanding electronics industry.

References

American Business
4660 Ravenswood
Chicago 40, Illinois

Association for Computing Machinery
2 East 63rd Street
New York 21, New York

Automatic Control
430 Park Avenue
New York 22, New York

Automation
Penton Building
Cleveland 13, Ohio

Automation Consultants, Inc.
1450 Broadway
New York 18, New York

Control Engineering
330 West 42nd Street
New York 36, New York

The Controller
1 East 42nd Street
New York 17, New York

Harvard Business Review
Soldiers Field Station
Boston 63, Massachusetts

Instruments and Automation
845 Ridge Avenue
Pittsburgh, Pennsylvania

Journal of Association for Computing Machinery
(see Association for Computing Machinery)

Journal of Machine Accounting
6109 North Karlov
Chicago 30, Illinois

The Office
232 Madison Avenue
New York 16, New York

Office Management
212 Fifth Avenue
New York 10, New York

Railway Age
30 Church Street
New York 7, New York

Reinhold Publishing Corporation
(see Automatic Control)

Richard Rimbach Associates
(see Instruments and Automation)

Stanford Research Institute
Stanford, California

Wall Street Journal
44 Broad Street
New York 4, New York

See DPD October, 1955, for list of seventy-six periodicals regularly reviewed for significant information in the data processing and related fields.

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